Test Report

No. : CE/2019/A0022 Date : 2019/10/08

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

The following samples was/were submitted and identified by/on behalf of the applicant as :

Sample Description	:	NIPPON AU BONDING WIRE
Style/Item No	:	T-SERIES(T1,T2,T3,T6)
Sample Receiving Date	:	2019/10/01
Testing Period	:	2019/10/01 to 2019/10/08

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Test Requested :

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Result(s) : Please refer to following pages.

Troy Chang / Manager - Tec
Signed for and behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei

NIPPON MICROMETAL CORPORATION
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Test Result(s)

PART NAME No.1 : GOLDEN COLORED METAL WIRE

Test Item(s)	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-OES.	2	n.d.
Lead (Pb)	mg/kg		2	n.d.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+ AMD1:2017 and performed by ICP-OES.	2	n.d.
Hexavalent Chromium Cr(VI)(#2)	µg/cm²	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.
Sum of PBBs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	n.d.
Monobromobiphenyl	mg/kg		5	n.d.
Dibromobiphenyl	mg/kg		5	n.d.
Tribromobiphenyl	mg/kg		5	n.d.
Tetrabromobiphenyl	mg/kg		5	n.d.
Pentabromobiphenyl	mg/kg		5	n.d.
Hexabromobiphenyl	mg/kg		5	n.d.
Heptabromobiphenyl	mg/kg		5	n.d.
Octabromobiphenyl	mg/kg		5	n.d.
Nonabromobiphenyl	mg/kg		5	n.d.
Decabromobiphenyl	mg/kg		5	n.d.
Sum of PBDEs	mg/kg		-	n.d.
Monobromodiphenyl ether	mg/kg		5	n.d.
Dibromodiphenyl ether	mg/kg		5	n.d.
Tribromodiphenyl ether	mg/kg		5	n.d.
Tetrabromodiphenyl ether	mg/kg		5	n.d.
Pentabromodiphenyl ether	mg/kg		5	n.d.
Hexabromodiphenyl ether	mg/kg		5	n.d.
Heptabromodiphenyl ether	mg/kg		5	n.d.
Octabromodiphenyl ether	mg/kg		5	n.d.
Nonabromodiphenyl ether	mg/kg		5	n.d.
Decabromodiphenyl ether	mg/kg		5	n.d.

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Test Item(s)	Unit	Method	MDL	Result No.1
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8 (2017). Analysis was performed by GC/MS.	50	n.d.
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg		50	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	n.d.
Halogen				
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582 (2016). Analysis was performed by IC.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg		50	n.d.
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg		50	n.d.
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg		50	n.d.
Perfluorooctane sulfonates (PFOS-Acid, Metal Salt, Amide)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	10	n.d.
PFOA (CAS No.: 335-67-1)	mg/kg	With reference to US EPA 3550C (2007). Analysis was performed by LC/MS.	10	n.d.
Antimony (Sb)	mg/kg	With reference to US EPA 3050B (1996). Analysis was performed by ICP-OES.	2	n.d.
Arsenic (As)	mg/kg	With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.	2	n.d.

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Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = less than MDL
4. " - " = Not Regulated
5. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI)
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.

PFOS Reference Information : POPs - (EU) 2019/1021

Outlawing PFOS as substances or preparations in concentrations above 0.001% (10ppm), in semi-finished products or articles or parts at a level above 0.1%(1000ppm), in textiles or other coated materials above 1μg/m².

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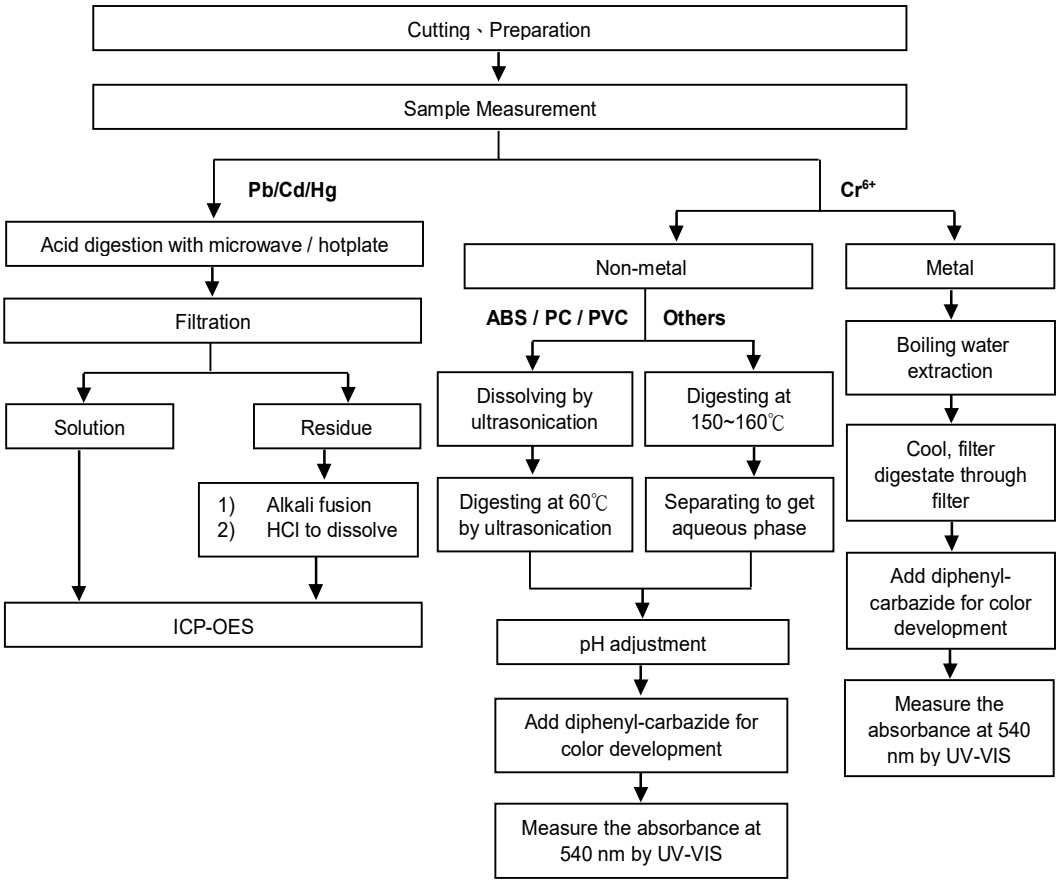
Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart.（Cr^{6+} test method excluded）

- Technician : Rita Chen
- Supervisor: Troy Chang



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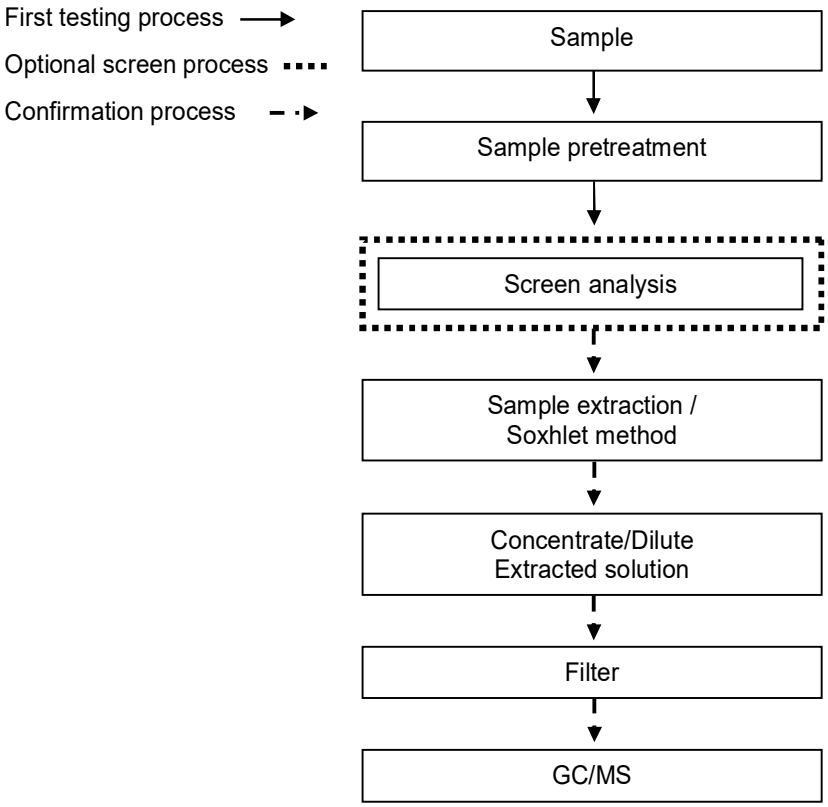
Analytical flow chart – PBB / PBDE

- Technician : Yaling Tu
- Supervisor: Troy Chang



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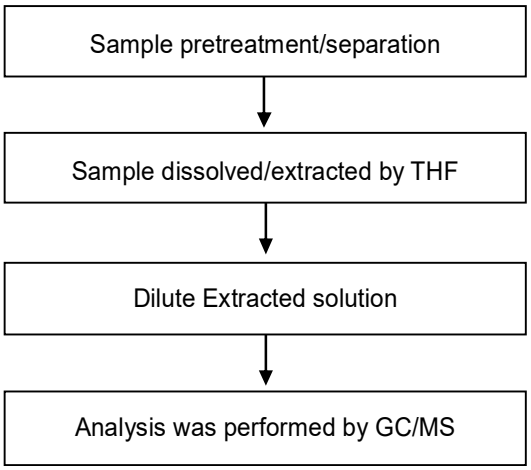
Analytical flow chart - Phthalate

- Technician: Yaling Tu
- Supervisor: Troy Chang

【Test method: IEC 62321-8】



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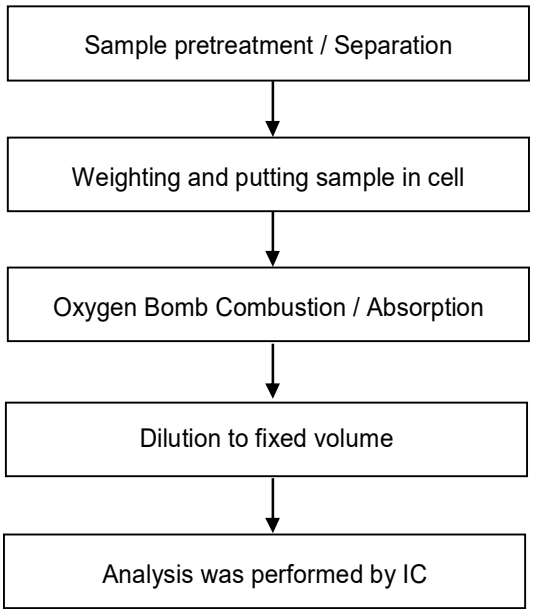
Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang



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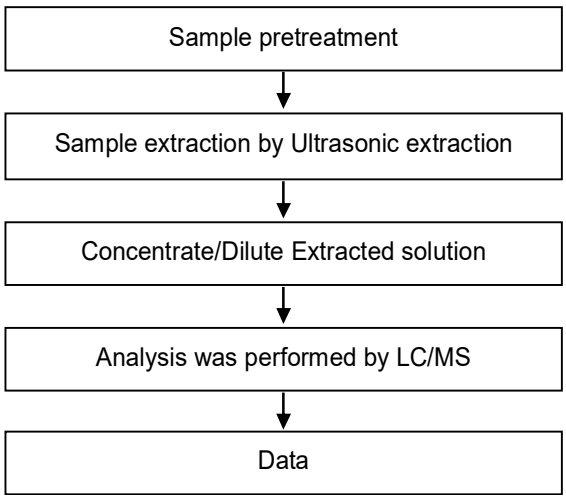
Analytical flow chart - PFOA/PFOS

- Technician: Yaling Tu
- Supervisor: Troy Chang



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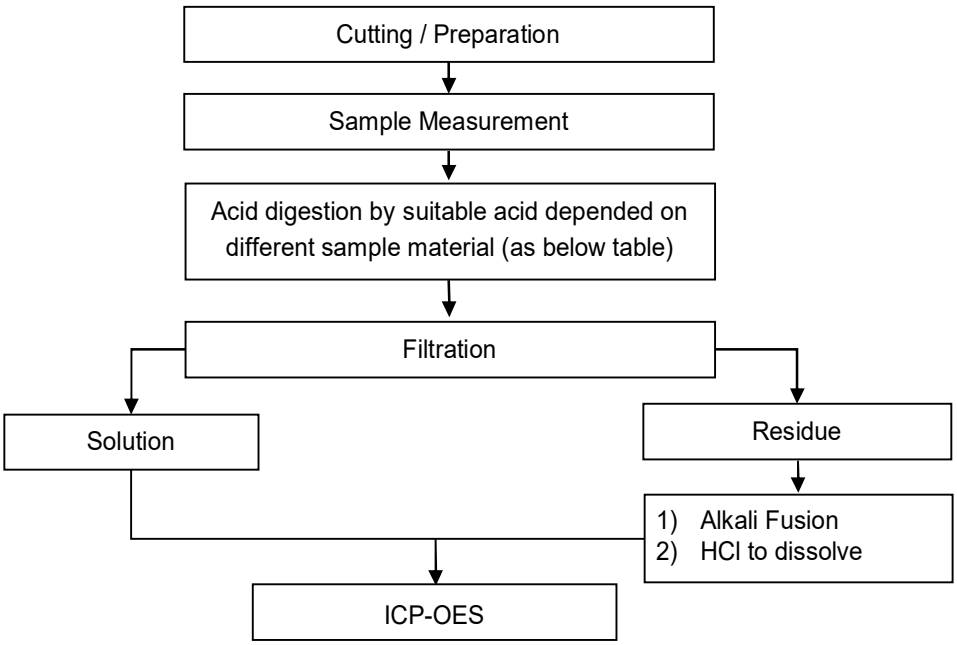
These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Rita Chen
- Supervisor: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-OES



Steel, copper, aluminum, solder	Aqua regia, HNO_3, HCl, HF, H_2O_2
Glass	HNO_3/HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO_3
Plastic	H_2SO_4, H_2O_2, HNO_3, HCl
Others	Added appropriate reagent to total digestion

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*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

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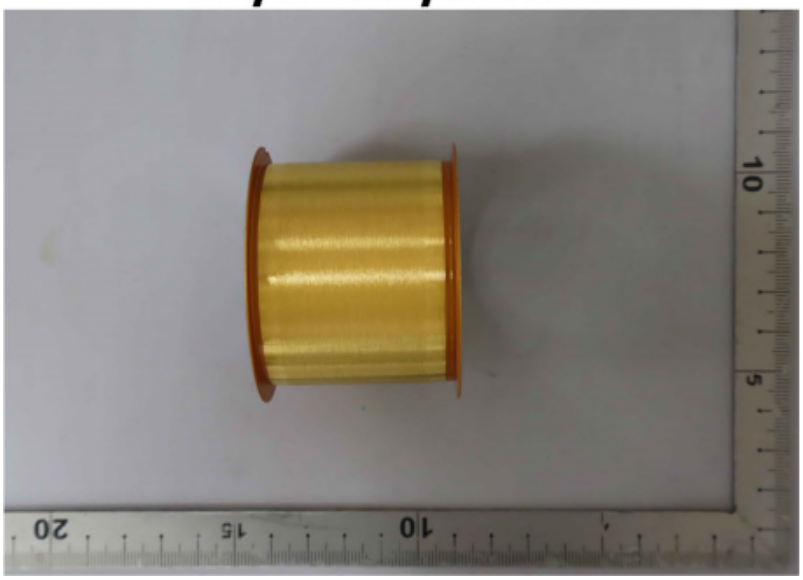

** End of Report **